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another place Steward[14] has suggested that, in addition to any inherent stability, the various Shoshone dialects did not diverge more rapidly because a semiromadic life kept groups in constant contact with one another. By contrast he points to the great linguistic diversity of the sedentary peoples of the Pacific Coast.

3.1. All stops, the affricate, and two spirants (s, h) are voiceless; other consonants are voiced. Points of articulation and consonants appearing at each are as follows: bilabial (p, v, m, w); alveolar (t, c, s, n, r); palatal (k, y); labialized palatal (k^w), glottal (?, h).

A rare consonantal phoneme, x or ḥ, occurs only in baby language[15] and in certain ejaculations. With the exception of r, a single post-alveolar flap, and a bilabial fricative, v, consonants approximate their English counterparts. Stops and affricates tend to be more strongly aspirated in medial position.

All consonants, with the exception of ? and s, and possibly v and y, occur in the cluster h plus consonant. An alternative phonemic analysis is to interpret this sequence as a distinct phoneme.[15] This analysis would add 9 to 11 preaspirated consonants to the list of phonemes; however their distribution would be rather limited. While there would be fewer consonant clusters following this interpretation, the phonemic description would be less economical. Whether aspiration has replaced other phonemes (? or vowel) in Comanche or is the result of a phonetic drift can only be demonstrated by comparative and historical methods.

[14] Julian H. Steward, Native Cultures of the Intermontane (Great Basin) Area, Smithsonian Misc. Col., 100.445-502, p. 476 (1940).

[15] Joseph B. Casagrande, Comanche Baby Language, IJAL 14.11-4 (1948).

[15] Venda Riggs, Alternate Phonemic Analyses of Comanche, IJAL 15.229-31 (1949) discusses the alternative solutions. Benjamin L. Whorf, p. 160, in Harry Hoijer and others, Linguistic Structures of Native America, VFPA No. 6, (New York, 1946), uses this analysis for Hopi.

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194 The absence of a pattern of contrasting voiced and unvoiced phonemes (b-p, d-t) allows for a degree of latitude in pronunciation: d^{v} and g^{v} commonly occur as idiolectal variants of y and k^{v} respectively. Voiced consonants tend to assimilate to their phonetic environment. They become voiceless or only weakly voiced before voiceless vowels, weakly voiced following h (or aspiration), and fully voiced elsewhere.

194 In this paper Comanche is written as it is
195 spoken in deliberate speech. In ordinary
[128] conversation there is slurring, more elision, omission of final voiceless vowels, etc."

194 All consonants except v and r occur in utterance initial position. The consonants v and r are defective in that they never occur in utterance initial position or after a pause in speaking. Further, they may alternate morphophonemically with p and t respectively at morpheme and word boundaries, although the conditions of alternation are not always phonologically determined; e.g., pa·kA *arrow*—nava·kA *bullet* (its arrow); tïvo·pï *paper*—nïrïvo·pï *my paper*. t, but not p, always occurs after i.

All consonants occur in utterance medial position.

Only ʔ and h occur in utterance final, although in normal speech utterance final whispered vowels (see below) are often lazily pronounced and indicated only by the slightest movement of the speaker's lips, or they may be entirely omitted. In such instances the terminal phoneme is then heard as a consonant. Final ï in such a word as tihkapï *food*, is often heard as simple aspiration. Also, other consonants may occur finally in loanwords: waikin *wagon* (English); however there is a tendency for loanwords to conform to the Comanche pattern and acquire a final whispered vowel, e.g., papa·sI *potatoes* (Spanish, papas).

[192]

Consonant clusters are intersyllabic and

[113] " Julian H. Steward, Basin-Plateau Aboriginal Sociopolitical Groups, BAE-B, 120, p. 273 (1938); and D. B. Shimkin, Shoshone I: Linguistic Sketch and Text, IJAL 15.175-88, p. 175 (1949), note similar speed effects in Shoshone.

194 few in number. With a very few exceptions, chiefly in loanwords, there are no clusters of more than two consonants. Except where vowels are elided, and in a number of English loanwords, only the clusters h plus consonant and ? plus consonant, and, more rarely, h plus n, appear. Examples are: puhaknI or puhakhnI *church* (puha *supernatural power*, plus kahnI *house*; tu?re? *rubber*; tehnsé·? *ten cents* (English). The seeming cluster k or k^h plus consonant is common; however in every instance noted a medial vowel had been elided: ?eka- *red*, plus sīkwe? *half*, gives ?eksīkwe? *red half, an old style blanket*.

194 3.2. Vowels are unrounded in front position and rounded in back position (with i and u closer than e and o, respectively), and mixed in central position (mid close ī and low open a). These six vowels also appear long (i· and u·, e· and o·, ī· and a·); also whispered (I and U, E and O, Ī and A); rarely nasalized as in the morpheme, hą· *yes*.

The vowel ī approximates the vowels in English "look" and "luck". All vowels, lacking closely contrasting phonemes, vary somewhat from high to low: e.g., o may approach ɔ, or e approach ɜ, etc. Whispered and long vowels, which could also be described as clusters of two identical vowels, are of the same quality as their voiced short counterparts.

No vowels occur in utterance initial; and all vowels occur in utterance medial. Only long vowels, clusters, and whispered vowels occur in utterance final; however there is a tendency for most speakers to close an utterance ending in a long vowel or a cluster with a glottal stop or aspiration. An echo vowel is sometimes heard after a glottal stop: -a?(A).

Short morpheme final vowels become voiceless in utterance final position, e.g., ?e·kouī· *tongues*, and ?e·kO *tongue*. They also tend to assimilate to a preceding consonant, or to be replaced by simple aspiration. In utterance medial position

194 whispered vowels may be neutralized to ĭ, or elided. In the latter case its length may
[192] be retained in a pulse. When a long vowel loses its accent, or when a following voiceless vowel becomes voiced, it often loses a mora; e.g., pu·kU *horse*, navukuwá·ʔ *automobile* (without its horse); tĭcipOsaʔ or tĭcipĭsaʔ *nut, bolt, screw*.

Only voiced vowels occur in clusters. The
[192] following have been noted: ia, ĭa, ĭe, ĭi, ai, oa, ua, ui, and ue. Examples are: pia- *big*; mĭa *moon*; tĭe- *little*; ʔĭvĭiʔ *mole*; haicI *friend*; cospĭ *shoulder*; suavE *cross*; pui *eye*; wihtue *bucket* (objective). -aʔe-, -oʔi-, and -uʔe- are frequently pronounced as clusters in rapid speech; e.g., noʔi *egg* becomes noinĭ· *eggs*.

Stress most frequently falls on the first
[104] syllable. When it does it will not be marked in this paper. An apparent exception to the rule that stress tends to fall on one of the first three syllables of a word is to be found in a long list of names of plants and animals and a few inanimate objects.[a] These words are polysyllabic and end with a stressed long vowel plus ʔ. By analogy the names of many new traits are fitted into this pattern.
[192] Examples are: pohkó·ʔ *burrowing owl*; ʔaʔahká·ʔ *banana*; waʔrokiyá·ʔ *pliers* or *crayfish*. A secondary stress may occur on the first syllable of both these and other long words.

Subject to the qualifications noted above in discussing the distribution of various phonemes, the syllabic pattern is the sequence CV or CVC. The vowel may be
[196] long, short, whispered, or a cluster. Other prosodic features such as tone or phrase and sentence melody, except for a few expletives, seem to be only idiosyncratically meaningful.

193 **3.3. Prefixation** even including prefixed clitics, while of less importance morphologically in Comanche than suffixation, is highly productive of neologisms and bulks large in the acculturation vocabulary.

[113] [a] William S. Smalley, Phonemic Rhythm in Comanche, IJAL 19.297-301 (1953).

[p. 147-B]

193 Derivational prefixes include a set of instru-
196 mentals, a reflexive, na-, and an intransi-tivizer, tī-.

Instrumentals are: pi?-[1] *with the buttocks, behind, or referring to the buttocks or rear* (similarly for the others); ta?- *with the foot or leg*; to?- *with the fist, or violent movement of the hands, also with the hoof*; kī?- *with the teeth, or scissors* (extended meaning); ku?- *by heat*; ca?- *by force, usually with the hands; direction towards the body or upwards*; ci?- *with a pointed object (knife, penis, stick), direction away from the body*; co?- *with the head*; ma?- *with the hand, pertaining to the hand*; mu?- *with the nose or mouth*; sī?- *with the feet, by paddling*; wī?- *with the body, movement sideways*; ki?- *with the elbow*; hu?- *with the back*.

Examples: mu?nua?, *hog*, (mu?- + nua? *move*); ma?nua? *checkers, chess, dominoes*; tahpu·nI *to test with the foot*, or *to try on shoes*, (tah- plus pu·nI *to see*), similarly, kīhpu·nI *taste*, and for the others.

The prefix, na-, when reduplicated, has reciprocal meaning: navuni? *mirror* (na- plus pu·nI *to see*, plus -?, nominalizer); nanavuni? *window* (*to see each other*). With either reflexive force or meaning *part of, its*, na- is commonly affixed to words for parts of a saddle, automobile, wagon, etc.:[2] navukuwá·?a/nakhnI *auto body* (*auto's house*), navukuwá·?a/nava· *gasoline* (*auto's water*), navukuwá·?a/na?o·mO *wheel* (*auto's leg*), navukuwá·?a/narhoveno·kī? *brake* (*auto's loaded on the hind legs*).

The prefix tī- seems affixed to verbal stems or roots, with or without a subjectivizer, to intransitivize a verb or to make the meaning more general: tīnua? *broom* (tī- plus nua? *to move*); tima?cune? *file* (tī- plus ma?cune? *to rub with the hand*).

194 [1] h may alternate with ? for these instrumentals.

197 113 [2] Similarly for Pima, George Herzog, Culture Change and Language: Shifts in the Pima Vocabulary, in Language, Culture and Personality; Essays in Memory of Edward Sapir, pp. 66-74, (p. 68) (Menasha, Wisconsin, 1941).

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193 **3.4. Infixation, if indeed it may be so**
194 interpreted, is the least productive form of affixation. In an arbitrary class of stems the infix, -V-, indicating the morphophonemic
193 lengthening of a vowel, signifies the im-
194 perative;[41] e.g., hivi·pĭ *drunkard*, hi·vI
196 *drink!*; cihima *to pick up with a stick* and cihi·mA, imperative form. But the following imperative forms also occur: nohi? *toy* and nohI *play!*; kupita? *flashlight* and kupItA *light the fire!*. The singular imperative is phonetically the most economical form a root can take. All the above examples can also be interpreted as the phonetically mechanical results of an inflectional verbal suffix, -minus V (voicing of final vowel), used to indicate the imperative.

193 **3.5.** Suffixation is the most productive
[196] form of affixation. Derivational suffixes include the nominalizers, -pĭ and -?, which make nouns of verbal roots. These forms are
193 highly productive of new word formations
192 in Comanche and figure importantly in the names of new cultural acquisitions: tĭhka *eat* plus -? gives tĭhka? *fork*; nohko *bake* plus -pĭ gives nohkopĭ *bread, baked goods*.

[196] There is also a series of derivational classificatory suffixes which make nouns of bound qualitative roots: hu·- *wood, tree* + -pI gives hu·pI *tree*; mu·- *nose* + -pI gives mu·pI *nose*; pia- *big* + -pĭ gives piapĭ *big one*; ?eka- *red* + -vI(tĭ) gives ?ekavItĭ *red one*; yĭva·- *autumn* + -cI(?) gives yĭva·ci? *autumn grapes*. That these are derivational is shown by the fact that they are lost when combining with other stems; e.g., hu·ku·nA *matches* (*wood fire*); ?ekhaa·? *dye* (*red boiled*).

193 Inflectional suffixes may be either verbal
196 or nominal. They are numerous and convey

[113] [41] Henry Osborn and William A. Smalley, Formulae for Comanche Stem Formation, IJAL 15. 93-9, p. 94 (1949). The treatment of Comanche morphology in this paper, while approached differently, owes much to this pioneer statement. See also D. B. Shimkin, Shoshone II: Morpheme List, IJAL, 15.203-12 (1949), for a sketch of the closely related Shoshone language.

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193 a wide range of meaning. All verbal in-
196 flections are formed by suffixation. Among those productive of new words are: -kĭ *benefactive or causative*; navi?aikĭ? *rocking-chair* (na- *reflexive* + pi?- *with the buttocks* + ?ai *go, lope* + -kĭ + -? *nominalizer*).
192 -?e *habitual*; nĭmivó·?e·tĭ *camera* (nĭmĭ- *1st per. plural* + -i *objectifier* + po· *draw* + -?e + -V *plural* + -tĭ *nominalizer*). Other
193 verbal suffixes indicate mode, tense and
196 aspect. The following are rather tentative examples: -ma *completive*; -kwa *motion away*; -?tu?i *future (in positive statements)*; -wa?i *future (in negative statements)*; -?i *past, semelfactive*; -yU *past, durative* (?); -nA *continuative* (?); -kI *imperative, plural*; -yu *verbalizer, with substantive stems*; -hr (?).

Nominal inflectional suffixes convey such things as number, case (objective, subjective genitive), and nominalization: -tĭ *nominalizer*; -nĭ· *plural*; -V *plural*; -?a *genitive*; -kwĭ *dual*; -hĭ *dual (on proclitic pronominals)*; -ha *objective*; -hta *objective*; -i *objective*.

193 **3.6.** Enclisis: Morphologically enclisis may be considered as a special type of
[194] affixation. Clitics are phonologically bound to words, normally unstressed, and, although they stand after any inflection on the stem (enclitic position), they may themselves be inflected (proclitic position). Clitics may be either bound, that is appended to a stem and never uttered in iso-
[196] lation, or free. Examples of bound clitics are: -ca? *declarative*; huhcu·ca?/toyava?aiki/ yĭcĭ?I *that bird flew over the mountain* (huhcu· *bird* + -ca?); -se? *narrative* (in myths and stories); -ha? *interrogative*; -ĭ? or -ĭĭ? *diminutive*, etc. Free clitics may function morphologically as either clitics
193 or as stems (see below). Prepositional,
196 locative, pronominal, numerative, demonstrative, and other notions are expressed by clitics.

3.7. A paradigm of pronominal and demonstrative affixes which function as clitics is given below:

[p. 149-A]

193
196

Person		Singular		Dual	Plural
1st	possessive or objective	aI-	exclusive	nihi- -nikwI	nimi- -nuI
	subjective	-aI?	inclusive	tahi- -takwI, or -tah	-ta-, or -tamI -
2nd		?i- -IaI		mihi- -mikwI	-mI -
3rd	visible	ma- -ma?	emphatic	marhi- -marikwI	-marI -
	invisible	?u- -?u?	or -su(?)-	?urhi- -urikwI	-?urI -
	close	?i- -?i?	or -si(?)-	?ithi- -itikwI	-?itI -
	distant	?o- -?o?	or -so(?)-	?orhi- -orikwI	-?orI -
	very own	pI-,	or -aI- (medially)	pI-, or -aI-	pI-, or -aI-

Duality is expressed by the nominal suffixes, -hī and kwĬ, for the 1st and 2nd persons: pihīkanikĬ?urīkwĬ *they* (dual, invisible) *are at their own house* (pī- + -hī + kahnI *house* + kĬ *at, in* + ?urī + -kwĬ). For the 3rd person demonstratives duality seems to be expressed by an infixed h; however it is probably the result of reduction and assimilation: ?u-, 3rd person invisible, plus -tī, nominalizer, plus -hī, dual, gives ?ur(ī)hī. Inflection for plurality, except for the 1st person exclusive, is accomplished with the pluralizer, -V.

As proclitics these affixes function as possessives, or, plus an inflectional suffix, 193 -i, in the non-singular, as objectives. If any word precedes the verb in the sentence, the pronoun subject is generally enclitic to that 193 word. In clitic form they are unstressed. In 194 objective pronominals, where the suffix -i is added, phonetic assimilation may occur: 196 mihī- + -i + pu·ni *see* + -nī? gives mihivúninī? *I see you two.* Assimilation and reduction with -i also occurs in other stems; sonipĬnī· *grass* + -i gives sonipĬni· *grass* (obj.).

193 When inflected with nominal suffixes these 196 pronominal forms may stand as free stressed words: nī- + -nī, plural, gives nīnĬ *we* (*exclusive*). Both demonstratives and nondemonstratives may cluster with other clitics to constitute a free stressed word: nī?u? *it is I*; ?onai *from there*; ?inai *from*

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[12] are perhaps the most interesting category for the student of acculturation and culture change. From the number of loanwords in a language and from a knowledge of their provenience one can often arrive at a rough estimate of the amount of contact a people has had, of the nature of that contact, and of the contributions made by the donor culture or cultures.

Loanwords are heard by speakers of the borrowing language in terms of native phonetics, and unless there is a fair knowledge of the phonemes of the donor language, the borrowed words will be transmuted into [197] the native phonetic pattern. It might be mentioned here that the majority of the English-speaking persons with whom the Comanche came in contact probably spoke [197] a Southern American dialect. Thus, the [194] r in acre was probably not regularly pronounced and the Comanche ʔekī? is therefore a close approximation of the American pronunciation. Where Comanche has no exactly comparable sounds, foreign phonemes are translated into their nearest Comanche equivalents. The following table lists those most frequently heard:

Spanish	Comanche	English	Comanche
b	w	b	p
ð	o	-b-	-v-
l	r	f	p
r	ʔ	d	t
fr	p	g	k
rt	ht	ð	c
rk	ʔr	ʒ	c
nt	r	š	s
dr	r	l	r
		r	r
		rl	r

The Spanish vowels (i, e, a, o, u) have rather close equivalents in Comanche and

[113] Slavonic, Lg 20: 66–72 (1944); Alfred Senn, Polish Influence upon Lithuanian, Lg. 14: 148–153 (1938); E. H. Sturtevant, Linguistic Change: An Introduction to the Historical Study of Language (Chicago, 1917); and George L. Trager and G. Valdez, English Loans in Colorado Spanish, American Speech 12: 34–44 (1937).

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197 are easily transposed. English vowels are
194 heard by Comanche in their cardinal positions and are readily transmuted into their Comanche equivalents: ɪ to i, ɛ to e, æ to a, ɔ to o, ʌ and ə to ĭ, etc.

194 There is a tendency for loanwords, es-
197 pecially those of an earlier vintage and in general currency, to conform to Comanche
192 patterns of phonetic distribution described in 3.1. Consonant clusters are often reduced to a single consonant, or transmuted to the Comanche form of h or ʔ plus consonant, and borrowed words also tend to terminate in aspiration, a glottal stop, or a whispered vowel.

121 Phonetic transmutation may often be of considerable help in dating both the introduction of a new word and the trait to which it refers. Older borrowings tend to become more closely assimilated to the native phonetics. Thus, Trager in a study of loanwords in Taos, the language of a Pueblo tribe, expresses the opinion that the words which depart most radically from the original Spanish may be considered the oldest loans.[87] Spencer makes the same point with respect to the use of Spanish by the Keres.[88] He also notes that, "In the forms which are presumably older, considerable irregularity in sound shift from Spanish to Keresan
197 is apparent".[89] The same general tendencies
194 may, I believe, be observed in Comanche
192 where earlier loans, i.e., those noted by Detrich in 1895 and marked with an asterisk
[128] in the lists which follow, seem to diverge more markedly from their original Spanish pronunciation. Following this, and even in the absence of confirmatory historical evidence, we would assume that such Comanche loanwords as **kavirí·ʔ** and **poʔroʔ** from Spanish, and **paisé·ʔ** and **wo·mĭn** from English are of earlier introduction. It should be

[113] [87] George L. Trager, Spanish and English Loanwords in Taos, IJAL 10: 144-158, p. 145 (1944).

[88] Robert F. Spencer, Spanish Loanwords in Keresan, SJA 3: 130-146, pp. 132-133 (1947).

[89] Robert F. Spencer, Spanish Loanwords in Keresan, SJA 3: 130-146, p. 133 (1947).

A [See p. 146-A--Analyst.]
[p.229-A]

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197 194 192 noted, however, that Comanche phonetics correspond more closely to Spanish than English phonemes.

121 Occasionally where there has been a long history of contacts, the same sounds have been consistently transmuted into different native phonemes at different historical periods. This has been true for the Yaqui where such phonetic clues have been useful as an aid in allocating Spanish words to the probable period of their introduction.[90] The same holds for Oneida which has borrowed rather extensively from English for several centuries.[91] Here older borrowings were fitted more stringently into a rather fixed pattern of phonetic equivalents which has been somewhat relaxed for later loans.

192 194 197 While Comanche pronunciation of loanwords, especially those of more recent origin, varies depending upon the speaker's knowledge of Spanish or English, the words listed below are spoken unselfconsciously AS IF they were native forms and are an integral 128 part of the Comanche language. All the examples collected are given and it is felt that the list is virtually complete.

192 With the Spanish model in parentheses: pa·nI[92] pa·nU *white bread, store bought loaf* (pan); pa·pasI *potato, potatoes* (papas); *pihú·ra?[93] *beans, peas* (frijoles); *pihná·?[94] *sugar, candy; sweet* (panocha); *po?ro? *pig; bacon* (puerco); *tohtíya? *wheat; bread of any kind* (tortilla); to·rosi? *cattle* (toro +

[90] Edward H. Spicer, Linguistic Aspects of Yaqui Acculturation, AA 45: 410–426, pp. 420–423 (1943).

[91] Floyd Lounsbury, Personal Communication (1941).

[197] [92] Southern Paiute, a language closely related to Comanche, has made the same loan from Spanish and has added a whispered vowel: pa·nA. Edward Sapir, Southern Paiute Dictionary, Proc. of the Amer. Academy of Arts and Sciences, 65: 537–730, p. 600 (Philadelphia, Pa.; 1931).

[113] [93] Ralph V. Chamberlain, The Ethno-botany of the Gosiute Indians of Utah, MAAA Vol. II, Part 5, pp. 329–406, p. 373 (1900) gives pi-o-ra as a term for everlasting pea in Gosiute. The Comanche term may be an extension, or both may be loans from Spanish.

[94] See footnote 62.

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192 ʔotĭmu·raʔ *oatmeal*. Actually this is a loan from English, oatmeal, but the phonetically equivalent Comanche form literally means *brown mule*. The word is not in established usage; however it affords an excellent example of a folk etymology in the making.

[194] wasapéʔatĭhkapĭ *pear* (*bear's food*). As there is no p-b distinction in Comanche *pear* must have been heard as *bear* and so translated. The *food* was probably added to rationalize the word. It may be noted, however, that the Comanche names for a great many plants contain the word for *food*, tĭhkapĭ.

waʔo·rĭhkapĭ *catsup* (*cat food*). This word as catsup, ketchup or catchup is probably an example of a folk etymology in English and comes from an East Indian word, kitjap.

wokorĭhkapĭ *pineapple* (*pine food*). While this word is similar to the two above, it is perhaps more properly an example of translation-borrowing.

197 Because of their close association and the parallelism in the later history of the Kiowa and the Comanche it seems pertinent to discuss briefly here the Kiowa acculturation vocabulary.[123] The similar roles of the two tribes as culturally and politically dominated peoples is apparently reflected in their like linguistic reactions to White influences. Kiowa has used the same devices for expanding its vocabulary and has also in a great many instances duplicated Comanche acculturation terms. In fact, one suspects that a certain amount of translation-bor-

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[121] unwritten language, in Oneida lodisg, lagéhtᵊ, literally *they carry mats on their shoulders* and which means *warriors in a band under a leader, privates or common people*, has for nearly all speakers been changed to lodisg, ʔihagéhtᵊ, the literal meaning of which is *they carry rust on their shoulders*. Personal communication from Floyd Lounsbury.

[123] John P. Harrington, Vocabulary of the Kiowa Language, Bulletin 84, BAE (Washington, D. C.; 1928), is the source of this material.

[p.234-B]

121 of the old and the new, such extensions often
192 afford clues not only as to how new traits
197 are perceived, but also to the way in which they are integrated into the culture. The extension in Comanche of puha *supernatural power* to the spheres of both medicine and religion is an example (see **4.1**).

121 6. When a meaning has been extended, if a modifier is used to distinguish between what is native and old and what is foreign and new, the relative importance of the two traits may be indicated by the differential use of these modifiers (see **4.1**).

[194] 7. A rare distribution of a phoneme or
[192] a deviant cluster of phonemes in a word suggests that the word has been borrowed; e.g. kv and ks in sikvic *six bits* and taks *tax, taxes*. The initial ts in tseetsee fly is an example from English.

[192] 8. A polysyllabic word of more than the usual minimum length which is unanalyzable into smaller meaningful elements is apt to be borrowed:[185] tomá·ta? *tomato* (tomate, Span.); makaró·ni? *macaroni* (Eng.). In both of these examples, additional evidence of their foreign origin is afforded by the fact that the stress does not fall on the first syllable (see **3.2.**)

9. In general, the more closely a borrowed word is assimilated to the phonetics of the borrowing language, the older it is and the earlier the trait it denotes has been introduced into the culture.

121 10. The longer a loanword has been in a
192 language the greater the tendency for it to
197 acquire a wider range of meaning or to be used metaphorically or in figurative expressions; e.g., mu·ra? *mule* (Span., mula) in ?evimú·ra?ya?ke? *frog*, literally *green mule crier*.

121 11. The linguistic source of a loanword
177 will suggest the provenience of a new cul-
192 tural acquisition; e.g., the Comanche were

[185] Edward Sapir, Time Perspective in Aboriginal American Culture, A Study in Method, Memoir 90, Canada Dept. of Mines (Ottawa, Canada; 1916) p. 60, discusses this point in some detail.

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121 introduced to the mule, bread, sandals and
177 vests by the Spanish; to money and admin-
192 istrative offices by the Americans.

121 12. The areas of culture represented by loanwords may indicate differential effects of several impinging cultures (see 4.3).

13. The number of loanwords in a language, while no absolute index, may indicate the extent or amount of contact one culture has had with another (see 4.3).

14. Other things being equal, the greater the proportion of loanwords and loan-translations in a language, as opposed to meaning extensions and new coinages, the more intense, intimate or lasting the culture contact has been.

15. Since loan-translation requires the borrowing of a foreign mode of thought, description or expression, rather than the incorporation of a foreign word, it reflects a more subtle influence than the borrowing of loanwords. The use of loan-translations in any number may be indicative of a deeper and more thorough-going acculturation (see also proposition 18).

121 16. When the analysis of what is appar-
192 ently a descriptive word is obscure there is a
197 strong likelihood that it is an older word: pïesu?ve? *bandana*, and pimoró·? *cattle*. In these two examples there is, of course, also the possibility that meaning extension and borrowing respectively have occurred.

121 17. If phonetic or grammatical reduction
192 occurs in a descriptive word, or phonetic
194 reduction in a loanword, it is apt to be of
197 relatively early origin: ?eksahpana? *soldier*; in this word ?eka- *red*, has been reduced to ?ek-. In tehnsé·?, from English *ten cents*, phonetic reduction has also occurred.

121 18. The elements used in new descriptive
192 formations will often indicate the approxi-
177 mate date or period of introduction of a new trait. The Comanche word for *soldier*, ?eksahpana? *red belly*, describes a type of uniform no longer used; the words for *Democrat* and *Republican* refer to party symbols, the rooster and the eagle, of an earlier era. One could also include here the

14: Riggs L-5 (1948) 1965 NO6 Comanche NO6
Oklahoma

000 ALTERNATE PHONEMIC ANALYSES OF COMANCHE

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0. Introduction
1. Consonants: Analysis A
2. Consonants: Analysis B
3. Discussion
4. Vowels
5. Stress

128 0. This paper presents two alternate phonemic analyses of the consonants of Comanche, a Uto-Aztecan language.[1] The 128 question involved is whether the sequence h 194 plus consonant should be regarded as a consonant cluster or as a unit phoneme in 128 this language.[2] In section 3 the relative advantages and disadvantages of each solution will be discussed without any attempt to favor either analysis. The writer, however, prefers analysis B.

128 194 1. Consonants: Analysis A. In this analysis the sequence h plus consonant is interpreted as a consonant cluster.

194 1.1. Stops and spirants generally occur in unique allophones, namely voiceless; h is assimilated to preceding vowels and following nasals.

Stops: p, t, c (an affricate, patterning as stop), k^w, k, ʔ. Examples: paa *water*, picipə *milk*, taaʔ *son*, peetə *daughter*, caatə *good*, paciʔ *little sister*, k^weeniʔ *pointed hill*,

[101] [115] [1] The data on which this paper is based was gathered during the 1948 session of the Summer Institute of Linguistics at the University of Oklahoma. Comanche informants were Molly Weryavah, Emily Riddles, and Mrs. Joe Harry. I am indebted to C. F. Voegelin for suggestions in the presentation of the material.

[2] A third possible analysis, that of interpreting preconsonantal h as a voiceless vowel has not been considered due to the fact that Comanche voiceless vowels are contrastive as to quality, while the phoneme h is not. See section 1.1., Spirants.

[p. 229-A]

194 tənikʷərə *singing*, kooko? *hen*, toko? *grandfather*, ?ara? *uncle*, mo?O *hand*.

Spirants: s, h. Examples: sarii? *dog*, kesautə *wicked*, hiipI *drink*, paha? *aunt*.

1.2. Oral and nasal sonants are voiceless before voiceless vowels, only slightly voiced following h, fully voiced elsewhere.

Oral sonants: w, ʙ, r, y. In intervocalic position, w and y have idiolectal variants gw and dž respectively. The phoneme ʙ is a bilabial fricative; r an alveolar flap. Examples: wa?oo? *cat*, ?awO *cup*, təʙicI *very*, naiʙi? *young lady*, tərə?aitə *working*, karərənə? *I am sitting*, yakeetə *crying*, təhəəyA *pony*.

Nasal sonants: m, n. Examples: mi?arə *going*, kimA *come!*, nə-rəa? *my son*, səsə?anA *sometime*.

1.3. The distribution of the consonants according to analysis A is as follows:

All consonants occur in utterance medial.

The phonemes ʙ and r occur in word initial but not in utterance initial.[3] All other consonants occur in utterance initial.

Only ? and h occur in utterance final.

Consonants occur in the following clusters, which appear only in utterance medial:

h + p, t, c, kʷ, k, w, r, m, n
? + n, r
n + h

2. Consonants: Analysis B. In this analysis the sequence h plus consonant is inter-

[3] The phonemes ʙ and r alternate morphophonemically with p and t respectively. Conditions of alternation are not always phonologically defined. Cf. nə-rəa? *my son*, ?ə-təa? *your son*. In utterance initial position, however, v and r are always replaced by p and t respectively, and r is always replaced by t following i.

[p. 229-B]

194 [128] In this analysis the sequence h plus consonant is interpreted as a unit phoneme, i.e. a preaspirated consonant.

2.1. Consonants which show an opposition of preaspirate versus simple are certain stops and continuants. The stops always appear voiceless; the preaspirate continuants are only slightly voiced; the simple continuants are voiceless before voiceless vowels, voiced elsewhere.

The stops are:

Preasp. ʻp, ʻt, ʻc, ʻkʷ, ʻk

Simple p, t, c, kʷ, k

Examples: ʔaʻpəʔ *father*, kaʻpeʔ *bed*, ʔəʻtui- *to give (sing.)*, moʻtoʔA *pimple*, tuneʻci- *to run*, paʻcikeetə *slick*, yaʻkʷi- *to say*, tənəcaʻkʷeyaʔi- *to skin*, təʻka- *to eat*, naʻkia *maybe*, paha? *aunt*, tamiʔ *little brother*, caatə *good*, kʷiipə *smoke*, kaku? *grandmother*.

The continuants are:

Preasp. ʻm, ʻw, ʻn, ʻr

Simple m, w, n, r

Examples: naʻmeitə *table*, kaʻnI *house*, taʻniʔikI- *to put (with plural object)*, wokoʻwiʔ *squirrel*, puhiʻwI *money*, noʻrənapI *bed*, ʔuʻri- *third person obj. dual*, marɨaʻweʔ *greeting*, waʔooʔ *cat*, naramaʔipA *story*, karərə *sitting*.

2.2. Remaining consonants are those consonants in analysis B which do not show opposition of preaspirate versus simple. Their allophones are as described under analysis A.

Stop: ʔ. Examples: miʔarə *going*, ʔaraʔ *uncle*.

Continuants: ʙ, s, y, h. Examples: ʔonaʙiʔ *salt*, muʙipóroʔ *pig*, saʙiiʔ *dog*, sahopA *broth*, yəʻkʷi- *to say*, təhəəyA *pony*, haicI *friend*, pahaʙitə *swimming*.

2.3. The distribution of consonants under analysis B is as follows:

All consonants occur in utterance medial.

All simple (i.e. non-preaspirate) consonants except ʙ and r (as explained in section 1.3.) occur in utterance initial.

Only ʔ and h occur in utterance final.

There are only three consonant clusters.

[p. 230-A]

194 Two with glottal stop as prior member (ʔn, ʔr) and nh; these occur in utterance medial.

3. Discussion. Analysis A presents fewer phonemes but more consonant clusters than does analysis B. Yet analysis B, while introducing nine new phonemes, making a total of twenty-three consonants instead of the fourteen afforded under analysis A, presents an interestingly symmetrical system, with oppositions totally lacking under analysis A.

Following analysis A, morpheme boundaries occur between h and a following consonant. This is the case with the form ʔuhri- *third person dual, object out of sight*, where -h- is a dual marker. Under analysis B dual
121 would be marked here by preaspiration. It has been suggested in interpreting other languages that an adequate description is one which permits morpheme boundaries which do not necessarily coincide with phoneme boundaries. An example of this is found in Oaxaca Chontal, where in some instances the third person marker consists of palatalization.[4] Nevertheless, the theoretical advantages and disadvantages remain to be argued.

194 According to analysis B, one may set up a series of morphophonemic alternations of simple with preaspirate consonants. In adjectives, a simple consonant may be replaced by its corresponding preaspirate in reduplicated forms. cf. paʔatə *long*, paʻpaʔatə *long(redup.)*. In verbs, a preaspirate consonant may be replaced by its corresponding simple consonant in certain formations. cf. t karuʔi-n *I shall eat* (stem təʻka-), təkənəninaʔ *I was eating* (alternate stem təkə).

194 The phonemic system of Comanche under analysis A seems to correspond more closely
197 to the phonemic systems of the other Uto-Aztecan languages than does the system proferred under analysis B. The phonemes of
197 Proto-Uto-Aztecan apparently had no such double series of consonants as would result from the postulation of a series of preas-

[4] Viola Waterhouse, Learning a Second Language First, IJAL 15.106-109 (1949).

[13]

[p. 230-B]

197 pirate consonants, while consonant clusters are not at all rare in the Uto-Aztecan lan-
197 guage family. Comanche preaspirates may
197 correspond to simple consonants in cognate
194 languages. cf. So. Paiute yəŋə, Com. yə'nə? *porcupine*; Tübatulabal tək-, So. Paiute təq.a, Com. tə'ka- *to eat*; So. Paiute qân.i-, Tübatulabal ḥani, Com. ka'nI *house*; So. Paiute ap.əi-, Com. ?a'pəi- *to sleep (sing.)*; So. Paiute aq.əi-, Com. ?ə'ko?i- *to sleep (pl.)*.

194 4. Vowels. Only one analysis is presented for the vowels; these are voiced and voiceless.

Voiced: i, e, a, o, u, ə. Vowel ə is a high, unrounded vowel varying from central to back position. Vowels i, e, o, u vary from close to open varieties; a varies to [ʌ] in unstressed position. Examples: piapə *big*, tena'pə? *man*, papI *hair*, sonipə *grass*, hunubI *creek*, wənə-nə? *I stop*.

Voiceless: I, E, A, O, U, ə. These are of the same quality as their corresponding voiced vowels. In normal speech, utterance medial ə appears somewhat shorter than other voiceless vowels.[1] Examples: ?ekabItə

[1] This fact has given rise to still another interpretation of Comanche phonemes: namely that of considering voiceless, when occurring in medial position, as aspiration of the preceding consonant. See Henry Osborn and William A. Smalley, Formulae for Comanche Stem and Word Formation, IJAL 15.93-99 (1949), where the form təkəbanitu-?i-nə? *I will always be eating*, is transcribed [tikʰ-binitu?i-nI?]. This interpretation admits of a

[113]

[p. 231-A]

194 *red*, hayarokʷEtI *four (as used in counting)*, sahopA *broth*, ssəmanUrii *ten (used as object)*, moʔO *hand*, təkənənitə-nəʔ *I keep on eating*.

The distribution of the vowels is as follows:

All vowels occur in utterance medial.

Only voiceless vowels and vowel clusters occur in utterance final. When a morpheme with a final single voiced vowel occurs in utterance final position its final vowel is replaced by a voiceless vowel of corresponding quality.

Only voiced vowels occur in clusters. These are of two members, which may consist of identical or diverse vowels. All voiced vowels occur in identical clusters. Examples: tiipE *mouth*, kʷeeniʔ *pointed hill*, caatə *good*, kooneʔ *face*, huupI *tree*, pəərA *arm (wrist to elbow)*. The following clusters of diverse vowels have been observed: a, u, e, o followed by i. kasaráinoʔ *angel*, pui *eye*, naʻmeitə *table*, kookʷaʔənoi *egg*, i, ə, o followed by a. piapə *big*, təasə *again*, moakU *lots*. ə, a followed by e. nəetə *wind*, pae *water (obj.)*.

128 **5.** In the examples given above stress is unmarked when it falls on the first syllable of a word; in all other cases it is marked.

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few more consonant clusters, but these are much less frequent in occurrence than the type h plus consonant, with which we are concerned.

[p.231-B]

15: Osborn & Smalley L-5 (1948) 1965 NO6 Comanche NO6
Oklahoma

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FORMULAE FOR COMANCHE STEM AND WORD FORMATION

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0. Introduction
1. Affix check list
2. Stem formation
3. Stem classes
4. Word formation

128 0. In this paper we discuss Comanche stem and word formation. The formulae utilized to represent the observed constructions grew out of an attempt to handle the cross-cleavage between stem classes and word classes. Although not all possible combinations of formational and inflectional elements have been found, this method of statement by formulae can be expanded to include any new combinations recorded.

193 Stem classes are characterized by their potential distribution with alternants of suffix 311, but are not identifiable by any feature of internal structure. Word classes are characterized by their potential syntactic distribution, and when inflected are identified morphologically by their final suffix (see 4).

193 128 1. Affix check list.[2] The following list is representative of the most commonly used

[101] [115] [128] [1] Data for this paper were gathered in the 1948 session of the Summer Institute of Linguistics at the University of Oklahoma. Comanche informants from Walters, Oklahoma, were Molly Weryavah, Helen Seahmer, and Emily Riddles. We are indebted to the staff of the Institute, particularly to Elliott Canonge and John B. McIntosh for technical information on Comanche, and to William L. Wonderly for advice in the presentation of the material.

[194] [104] [2] The phonemes of Comanche are analyzed as follows: p, t, k, k^{w}, ʔ; c; s, š, h; m, n, ŋ; w, y; i, I, e, E; ï, Ï, a, A; u, U, o, O. Large caps represent voiceless vowels; small cap B represents bilabial v. Stress /'/ is written immediately preceding the stressed syllable. Hyphen (-) represents morpho-

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128 affixes in Comanche. Some classes of affixes are not exhaustive (e.g. derivational affixes, class 100, which includes many more morphemes), but the pertinent classes for stem and word formation are represented.

Classification of affixes by centuries is as follows: 100 derivational, 200 verbal inflectional, 300 nominal inflectional. Classification by decades is generally on the basis of relative order. However, morphemes 201, 253, 254, 323 have been classified otherwise for convcnience of description since their relative order is not as pertinent as their identity with the group in which they are placed. Decimal numbers indicate mor-

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194
[104]
[128] logical juncture where clitic stems are bound to other stems or words (see 3.1.3., 3.1.4., 3.3.).

The recurrent morphophonemic changes are as follows: (1) Single morpheme-final vowels generally become voiceless in utterance-final position. 'kahnInI *houses* > 'kahnI *house*.

(2) In certain combinations morpheme-final vowels reduce to open transition of neutral vowel quality. In certain combinations morphemes reduce medially by the loss of one or more morae. Compare 'tIhka *eat* in the following: 'tIhkaru?i-nI? *I will eat*, 'tIkaInitu?i-nI? *I will always be eating* (['tIkᵃaInitu?i-nI?] in which [kᵃ] is approximately [kI] but without vowel mora); 'puukU *horse* + 'kahnI *house* > 'pukukaI ['pukukᵃaNI] *barn*.

(3) t interchanges with r; and p interchanges with B, utterance medially at morpheme boundaries under conditions not always phonologically determined. 'pani? *older brother*, nI-'nani? *my older brother*; 'tInoorI-ma? *he is writing*, 'caa-nI? 'rInoorI *I write well*. After pause the p and t always occur: 'tenahpI?a 'rInikʷIri-nI? 'nuni? *I see the man singing*, but 'tenahpI?a / 'tInikʷIri-nI? / 'puni? (in which / indicates tentative pause). t (but not p) always occurs after i. '?itI *this one* < ?i 3rd person close + -tI nominalizer; '?orI *that one* < ?o 3rd person distant + -tI; 'piaipIrII *large ones* <'piapI *big*.

(4) ? + ? = ?. 'sarii? *dog* + -?a genitive > 'sarii?a *dog's*.

[p. 93-B]

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322.1	-k^{w}I	dual → (fluctuates freely with 322.2 except as defined in alternants below)
322.2	-h	dual → (occurs in objective forms (plus 331); otherwise fluctuates freely with 322.1 except as in 322.3)
322.3	-hī	dual → (occurs on proclitic S^{pr})
323.	C_1V_1-	non-singular (for alternants and patterns of reduplication see **3.1.1.**).
331.1	-ha	objective → (generally with singular S^{a} ending in 131 or 132; reduction occurs: -ʔ + -ha > -ʔa)
331.2	-hta	objective → (with a group of S^{a} ending in a bilabial consonant + I)
331.3	-i	objective → (with a group of S^{a} ending in -tO and -cO without assimilation and reduction; occurs with S^{a} other than all above, and after 311, 321, or 322, with assimilation and reduction)[4]

2. Stem formation. Comanche stems are derived according to the formulae below. Patterns of stem formation do not coincide with stem classes. In these formulae a root (R) is a morpheme, free or bound, to which

[104]

[194]

[4] Final back vowels become voiced front vowels on the same level. The resulting vowel cluster is reduced by loss of the second member. 'yuhhu *grease* > *'yuhhii > 'yuhhi *grease* (object); 'wihtua *bucket* > *'wihtuei > 'wihtue *bucket* (object). When following 311 and 321 or 322, the assimilation applies to both morphemes. 'sonipɪ̈nɪ̈ *grass* (plural) > *'sonipɪ̈nɪ̈ɪ̈ > 'sonipɪ̈nii *grass* (plural object); 'huniyanɪ̈h *songs* (dual) > *'huniyanɪ̈hi > 'huniyanihi *songs* (dual object).

Examples of alternants 331.1 and 331.2: 'waʔooʔ *cat* > 'waʔooʔa *cat* (object); 'pihɪ̈kɪ̈i *peach* > 'pihɪ̈kɪ̈iha *peach* (object); 'toshwI *silver* > 'toshwihta *silver* (object); 'tosiitO *hoof* > 'tosiitoi *hoof* (object).

A stem which does not fit the pattern: 'yihnI *porcupine* > 'yihne *porcupine* (object).

193 derivational affixes may be attached, or with
104 which other roots may be compounded. R_1 is a free root. A stem (S) is a root, with or without derivational affixes, to which inflectional affixes may be attached, or which functions as an uninflected particle.

193 Stems contain only one stress, generally on
194 the first syllable, or none at all in the case of clitic stems. Examples: 'puhihwI *money*, 'to?I *pipe*, 'tīrī?ai *work*, wa'sape *bear*, nī-'ʁia? *my mother*.

193 Formulae for stem formation cover observed formations, but do not imply that any root may occur in all possible formational combinations.

R_1 = S. 'pui? *eye*, 'wa?oo? *cat*, '?ara? *cross uncle*, 'tīhka *eat*, 'mi?a *go*, 'haa *yes*.

110 + R = S. 'tahpaana *sole of foot* < 117 + -paana *palm*; tahto'koo *big toe* < 117 + -to'koo *first digit*; mahto'koo *thumb* < 112 + -to'koo *first digit*; tah'tua *little toe*; 'co?nika? *hat* < 114 + -nika? *push into*; 'soko-kī ma-'ci?nikatī-nī? *I am sticking it into the ground* < 119 + -nika? *push into*; ma'cihorarī-nī? *I am digging it (with a stick or spade)* < 111 + hora *dig*; ?u-'hu?kʷĪri-?a?i-nī? *I spilled it with my back* < 116 + kʷĪri?a *spill*.

120 + R ± 130 = S. 'naʁoopĪ *picture* < 121 + 'poo *draw* + 131; 'narīhka *groceries* < 121 + 'tīhka *eat*.

120 + (110 + R)' = S. 'narohtīkʷa?i-?inĪ *you hit yourself (with hand)* < 121 + (113 + tīkʷa *hit*).

R + 130 = S. 'tīhka? *table* < 'tīhka *eat* + 132; 'piapĪ *big* < 'pia- *big* + 131; 'tīhkapĪ *meat*; 'poopĪ *drawing* < 'poo *draw* + 131; 'huupI *tree* < 'huu- *wood, log, tree* + 133; 'paapI *head* < 'paa- *head* + 133; 'tenahpī? *man* < 'tenah- *man* + 134.

R + S = S (in which the S preceding the equation sign may be any stem including the resultant of this formula; however, the maxi-

' Immediate constituents are divided in this way because *120 + 110 (without R) never occurs. 110 + R = S above, but S cannot be substituted for 110 + R here because S resulting from other formulae do not occur with 120.

[p. 95-B]

16: Smalley L-5 (1949) 1965 NO6 Comanche NO6
Oklahoma

PHONEMIC RHYTHM IN COMANCHE

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0. Introduction
1. Rhythm
2. Lexically placed stress
3. Interpretation of vowel length
4. Conditioning of intonation
5. Gradient differences

0. At least two points of theoretic interest are revealed by an analysis of Comanche prosodic features.[2] The first of these is that there are rhythm patterns which are arbitrary and contrastive, and which to a degree at least carry emotional affect. They may also possibly be associated somewhat with grammatical sentence types.

The second point of interest is that Comanche shows no structured system indicating affective situations by contrastive intonational pitch contours such as occur in English and many other languages. Affective situations are indicated to a small degree by

[1] The research for and preparation of this paper was accomplished while the author was a guest instructor in linguistics at the Summer Institute of Linguistics at the University of Oklahoma in 1949. Credit is due to the Institute and to The Christian and Missionary Alliance for making this project possible. Data were collected on a tape recorder, with Mrs. Emily Riddles, of Walters, Oklahoma, as the main informant. Materials were checked, and conversation recorded with the help of several other informants. Special thanks are due to Kenneth L. Pike for suggestions and criticisms, and to Elliott Canonge for checking some of the analysis of intonation presented here. Parts of this paper were presented with recorded examples at the summer meeting of the Linguistic Society of America at Ann Arbor, Michigan, in July, 1949.

[2] Prosodic features are here defined as quantitatively significant phenomena. In Comanche these include phonemic stress, rhythm, and length, and non-phonemic pitch. This definition follows Kenneth L. Pike on 'suprasegmental phonemes' in Phonemics: A Technique for Reducing Languages to Writing, Ann Arbor, 1947, p. 63a.

121 194 emphatic stress and attentative rhythm[3] (and by particles), but pitch contour is conditioned by other factors.

121 A minimum of intonational contrast has previously been reported for Oto,[4] another Indian language of Oklahoma, but languages with little or no contrastive pitch system have not generally been described. In Oto intonational contrast occurs only on exclamations. Comanche however has not even that minimum of pitch contrast.

[194]

In discussing the nature of intonation, Bolinger has declared that it is 'both conventional and instinctive', that the physiological tension which is the basis of intonation can be 'trained out' (which, he feels, accounts for lexical pitch systems), and that English intonation is not an arbitrary structure because we do not 'occasionally deliberate about our choice of contours'.[5]

On the other hand, without denying the physiological basis of any part of speech or denying the close physiological association of GRADIENT differences of pitch, or of intensity of stress, this paper would lend weight to an understanding of the 'arbitrariness' of intonational SYSTEMS where they occur. Languages range from the complicated and contrastive system structure of English intonation to the lack of any such contrastive structure in Comanche.

121 194

The data presented here will show that in Comanche length, stress, and rhythm are interconnected in their distribution and mutual conditioning, patterning together in the total phonological structure,[6] and that

[3] A distinctive rhythm pattern with meaning 'attention here' (see 2).

[4] Kenneth L. Pike, The Intonation of American English, Ann Arbor, 1947, p. 21.

[5] Dwight E. Bolinger, Comments on Pike's American English Intonation, SIL 5.69-70 (1947).

[6] For a tentative list of other Comanche Pho-

[113] [113] [113]

194 [121] an adequate description of the phonology must include phonemic rhythm. The prosodic features operate on two levels, the lexical level and the level of the larger phonological and rhythm group. Examples of the interdependence of these features may be seen in that non-phonemic pitch is conditioned by lexical stress and vowel length. Emphatic stress furthermore potentially coincides in point of occurrence with lexical stress. Rhythm is also generally associated with lexical stress in its placement, and phonetically long vowels may be contrasted with phonetically short vowels only within the limits of rhythm. The details of the system follow.

194 1. Comanche utterances are characterized by a marked rhythm which consists of a sequence of secondary rhythm stresses with approximately the same timing between stresses. A rhythm unit is defined as the sequence of syllables grouped together by [104] such stresses or pause. The boundaries of rhythm units are marked with a subscript tic /ˌ/. ˌ|ˈtenahˌpɪʔˌcaʔ ˌ|ˈpɪsɪaˌnakɪˌkatɪ ˌ|ˈpuʔ-etu ˌ|ˈmiʔaarɪ̈ *The man with the big ears is walking in the road.* ˌ|ˈnameˌwahˌsɪ̈kʷɪˌtɪ̈ ˌ|ˈpɪsɪaˌkahniˌnɪ̈ *eight big houses.*

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[113] [104] nemes see Henry Osborn and William A. Smalley, Formulae for Comanche Stem and Word Formation, IJAL 15.93 (1949) fn. 2. The transcription used in this paper will follow that of Formulae except for the addition of /,/ anticipation pause, /./ non-anticipation pause, /ˈ/ emphatic stress, /ˌ/ rhythm marker, and /ˌˌ/ attentative rhythm, all defined in this paper. Hyphen (-) will not be used here because its only significance in Formulae is for certain morphological boundaries.

[113] For other views on Comanche segmental phonemes see Venda Riggs, Alternate Phonemic Analyses of Comanche, IJAL 15.229-231 (1949). The present analysis parallels generally her Analysis A in treatment of consonants, but differs from it in finding /n/ in 'utterance final' position (see text sentences 5, 8, 17, 18, 21 of this paper) in addition to her /ʔ/ and /h/ (p. 229), and in interpreting [ɪ̈], when non-syllabic, as non-phonemic aspiration of a preceding consonant. This interpretation results in a larger number of consonant clusters as inspection of the data will show.

194 Rhythm units in sequence tend to have perceptually the same timing, with some fluctuation and variation. So important is this timing that rhythm units of one, two, or even three syllables are sometimes perceptually alike in duration. In the following example the rhythm unit ˌʔa (because of the accompanying pause) is perceptually of the same length as such sequences as ˌˈparɪʙo. ˌˈʔiknɪʔ ˌˈkahnikɪ̈ ˌˈʔikahˌciʔ, ˌˈtɪʙooˈʔa, ˌˈtɪʙooˌpha, ˌˈtɪhkaˌʔa, ˌˈnakarɪˌʔa, ˌˈtɪasɪ, ˌˈparɪʙooˌʔa, ˌˈpuniʔ *As I come into the room I see the pencil, the paper, the table, the chair, and the pen.* In sentence (21) of the text[a] (6.1) there is some variation in timing due to the disparity of number of syllables in the units, but there is a tendency toward perceptual equalization wherever possible.

This perceptual regularity of rhythm unit timing is accomplished by several devices including pause (as in the example of the paragraph above) and the non-phonemic lengthening of a consonant to keep a phonemically short vowel relatively so and yet preserve the perceptual length of rhythm unit time.[7] ˌˈpiaroˌsaʙɪˌtɬ[·]ɪ̈ nɪ̈ˌˈkahnica? ˌˈkuhcu? ˌma?I *My big white house burned down.* ˌˈsɪ̈ˌmanoˌwɪmɪ̈ˌnaˌtɬ[·]ɪ̈ˌˈteˌnaˌnɪ̈ *nine men.* In sentence (9) of the text there occurs the example ˌˈtɪmaˌrɪˌm[·]uakuˌʙai *lots of water*; in sentence (18): ˌsuniˌˈnah[·]ˌkatɪ̈ *staying as he was.* In cases of irregularity of number of syllables in the rhythm group there may occasionally be no timing compensation, and irregular timing may occur. See text (20): ʔuˌˈtɬrɪcʔˌtɪ̈hˌciʔˌnɪ̈ *his dear little children*, where there is no adequate compensation for the disparity between the

[a] Section 6, Illustrative text will appear in a later issue of IJAL.

(104) [7] In the otherwise phonemic transcriptions of data in this paragraph the non-phonemic length is enclosed in brackets [·]. In the first example the consonant length is necessitated by the fact that voiceless vowels occur shorter than voiced vowels.

[p.298-B]

194 number of syllables in the respective rhythm units.

Rhythmic structural contrasts exist within utterances and between utterances, and the rhythm pattern of a given morpheme or sequence of morphemes is not always the same. In the following examples the sequence of morphemes ˈnī-mī-kuhcu? *buffalo* occurs with different rhythm patterns. ˌˈnīmīˌkuhˌcu?a ˌˈkumaˌīˌca? ˌˈpiaˌʉihīˌkʷahˌtītu ˌˈtooˌyīkaˌrīī *The buffalo bulls are grazing out on the prairie.* ˌˈsooˌtīīˌca? ˌˈpueˌkʷaci?ˌnīmīˌkuhcu? ˌnīmīˌˈpiaˌʉihīˌkʷahˌtītu ˌˈtooˌyīkaˌrīī *Those wild buffalo are grazing out on the prairie.* Compare also the morpheme ˈ?ahpi? *father* in text sentences (17) and (20), ˈtīasī *also* in (4) and (8), ˈmekī *said* in (2) and (3), ˈsurīkse? in (4) and (8).

Rhythm stress generally coincides with lexical stress where it occurs (see 2), but in some utterances lexical stress may be suppressed by rhythm. In such a case the high pitch feature of lexical stress is left to mark the point of its placement (see 4). In the following examples wherever rhythm stress does not coincide with lexical stress /ˌˈ/, but lexical stress occurs without rhythm /ˈ/, the lexical stress should be read with high pitch but no stress. nīˌˈrua ˈrīˌtaatī ˌˈyuupīˌca? nīˌˈnīasīˌmapīru ˌˈnīmiitī *My fat little son is in the yard.* ˌˈsurīkˌse? ˌˈsuˀaˌna ˈˀuˌrīīkī ˌˈʉihˌtīn *He took it out of the water.* Other examples may be found in text sentences (6), (11), (12), (14), (15), (19), and (20).

The rhythm units between pauses (/ˌ/ or /./*) comprise a rhythm group. There are more likely to be differences of timing between rhythm groups than between rhythm units of the same group. In text sentence (1), for example, the rhythm group ˌˈpekʷi ˌʉīˌˈtīrīˌeˀˌtīˌmaˌˀai *a fish with his children* occurs with even timing but different timing from the rhythm groups preceding or following. There is also a marked change of timing between the final rhythm group and those

* See 4.

[p. 299-A]

194 preceding it in (15). So far as has been ascertained at present, such differences are fluctuant and not meaningful.

194 The only association between rhythm and meaning differences so far detected is in
196 situations demanding attention ('attentative') as in imperative constructions and the drawing of exaggerated attention to words or specific parts of utterances. This rhythm pattern consists of a deliberate, slow rhythm with few syllables to the rhythm unit and marked extra lengthening. It may optionally correlate with emphatic stress. In the following illustrations attentative rhythm (symbolized /‖/ for each rhythm unit with which it occurs) should be read with each modified syllable long, and such rhythm units containing vowel clusters with exaggerated length. ‖ˈʔorii ‖ˈnĭmĭ‖kuh‖cuʔ‖nii ‖ˈpuuni *Look at those buffalo!* ‖ˈpia‖rikɨ‖kĭpĭ ‖ˈkima ‖ˈʔinU‖ni‖tU *Beefsteak,* (nickname of a person) *come here!* Text examples may be found in sentences (5), (7), (8).

194 2. The contrastive placing of lexical stress may be seen in the following words: ˈtosahwI *silver,* waˈsape *bear,* mahtoˈkoo *thumb,* kuyuˈniʔnĭI *turkeys,* nĭmĭˈkuhcuʔ *our* (pl.) *cow,* ˈnĭmĭkuhcuʔ *buffalo.*

Emphatic stress, which occurs occasionally for affective purposes, always coincides in point of placement with lexical stress. (See text sentences (9), (13), (14), (18).) Emphatic stress is used to give extra intensity to a situation, and not as in English to emphasize one word as against another. It may occur on a single point of lexical stress or at several such points in sequence. The distribution of lexical stress is most prevalent on one of the first three syllables of a word[9] and most often on the first syllable of a root or compound.

3. Interpretation of vowel length. Contrastive length of vowel may be seen in

[104] [9] The word is defined by implication as an intrapotential in Formulae pp. 98, 99. It is written bounded by space.

194 such pairs as ˈʔurĭ *that one* vs. ˈʔurĭĭ *those*, ˈtɬhkati *the one eating* (obj.) vs. ˈtɬhkatii *the ones eating* (obj.), ˈsookonai *lots of water* (obj.) vs. ˈsokona *on the ground*, ˈmeeku *now* vs. ˈmekĭ *said*. These phonetically contrastive vowel lengths are interpreted phonemically as a sequence of two identical vowels by analogy to other VV sequences as ˈmĭa *moon*, ˈpĭeckU *tomorrow*, ˈpiapĭ *big*, ˈʔihpĭi *sleep*, ˈtua? *son*, ˈtuinihpĭ? *boy*, and ˈtĭrie?tĭĭ *children*.[10]

Single vowels or sequences of identical vowels maintain their relative contrast except under conditions of morphemic alternation but the relative amount of difference in length between the two is conditioned by rhythm and position in the utterance. Sequences of identical vowels before pause (either /./ or /,/, see 4) are generally extra long. Non-phonemic modification of length is conditioned by rhythm as follows. (1) Within the same rhythm group (but not before pause) a sequence of identical vowels is perceptibly longer than a single vowel, but not as long as if before pause. (2) A single vowel in a rhythm unit containing only one syllable with only one vowel will still contrast with a rhythm unit containing a sequence of vowels or two syllables, even when the timing is maintained as approximately the same, by a non-phonemic compensatory lengthening of a following consonant or by slight pause if the short syllable comes at a point of optional pause (see 1). (3) When two parts of the utterance occur with rhythm groups which contain varying numbers of rhythm units, the relative contrast between single vowels and sequences of identical vowels applies only within the rhythm group be-

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[10] We cannot here decide the question as to whether or not such sequences constitute two syllables or one. For purposes of description here they are assumed to be one. So far as prosodic evidence is concerned, the evidence of pitch level would lend weight to interpretation as single syllables, whereas rhythm stress may occasionally occur on the second member of such a cluster as in ˌtĭrĭˌeˀˌtĭĭ [6.1 (1), (2)].

[p. 300-A]

194 cause a vowel of one group may be non-phonemically longer than a sequence of another group. In text sentence (21), ˌtihtīˌtaayuˌtuʔiˌnīī *ones who will be little* at least three perceptible phonetic vowel lengths occur. taa is phonemically long but phonetically shorter than nīī because the latter occurs alone in a rhythm group and the former does not. taa is shown to be phonemically long by its contrast with several short vowels in the same rhythm group.

4. The importance of rhythm (as limited as its affective meanings seem to be) is accentuated by the complete conditioning of pitch contours. In Comanche all utterances occur with the same relative intonational pitch contour. That contour may be described roughly as high pitch on lexically stressed syllables and regular pitch elsewhere, but there are other modifying factors which must be described.

194 104 Three basic phonetic pitch differences have been distinguished on voiced vowels:[11] pitch level[1] (high) occurs on lexically stressed syllables, sometimes with a slight drop on the end of a VV sequence. The height of pitch is correlative with the contrast between lexical and emphatic stress, extra height being sometimes associated with emphatic stress. Pitch level[2] (mid) occurs elsewhere except for optional[3] (low) before /./.

Variations of these pitches are: [1] > [1a] (high-falling glide) on stressed syllables which contain an identical VV cluster if the syllable is the last voiced syllable of the word (i.e., if the following syllable contains no voiced segments). [1] > [1a] (slightly higher than [1]) optionally preceding lexical stress within a word. [2] > [2a] (mid falling

[11] The superscript numbers, assigned to pitch differences which have been heard, have no significance except that of labels for phonetic phenomena. Examples in this section will be transcribed phonemically except for the pitch symbol in brackets with each syllable.

194 [104] to low) optionally on unstressed syllables containing a VV sequence before /./. ˈʔaˈnaa˥. (exclamation); ʔo˧˥ˈnoo˥. (exclamation); ˌˈʔiˈˌʁia˧roˈ˧ˌkoˈ˧ʔI. (exclamation); ˌˈʔɨ̄˥, ˌˈsɨ̄ma˧nuʔ˧, ˌˈwa˥-na˧ˌwi˧ˌwih˧ˌtaʔ˧, ˌˈsɨ̄ma˧ˌnai˧ˌku˧ ˈnaˈˌʁo˧riˈ˧ ˌˈʔu˥raˈ˧ʔI *Oh, I 'found a dollar bill*!; ˌˈʔu˧sɨ̄˧˥ ˌˈha˥kaa˧rɨ̄˥ *Who's that?*; nɨ̄˧˥ˌˈha˥kai˧, ˌˈyɨ̄˥˧kˣI *What shall I say?*; ˌˈkee˥˧ nɨ̄˧ˌˈrɨ˥ʁoo˧ʔ˧ˌma?˧ *No, that's my pencil*!

194 128 A check of texts, both narrative and conversational, made on tape recording, and observation of Comanche speech in other situations than informant ones, revealed that this one pattern with its variants occurs on all utterances.

[104] The distinction made here between /,/ anticipatory pause, and /./ non-anticipatory pause, is as follows. Non-anticipatory pause is a pause preceded or followed by a modification of pitch or rhythm. It may be preceded by a drop of intonation to ˥ or ˥˧. It may be preceded by a dropping of the general height of voice thrpugh the utterance and followed by a sudden raising of voice height at the beginning of the next utterance. It may be followed by a quickened tempo of rhythm in the beginning of the next rhythm group. Anticipatory pause, on the other hand, is a pause without any modification of the pitch or rhythm of preceding or following utterances.

194 [104] /./ may coincide with grammatical sentence units or may group several such grammatical units. In the text compare (1), (2), (3), etc., where the non-anticipatory pause coincides with grammatical units, and the latter parts of the text where fewer such pauses occur. /,/ anticipatory pause, may occur at any potential (symbolized here by space).

[p.301-A]

10: Smalley L-5 (1949) 1965 NO6 Comanche NO6
Oklahoma

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5. Some of the prosodic features described above occur occasionally in gradient degrees of difference. The range between non-phonemic pitches may vary without structural contrast under situations of extra stimulus.[12]

The total contour of an utterance or part of an utterance may be raised gradiently, especially in quotation situations, so that the quotation is optionally spoken on a higher pitch. This is true of text examples (2) and (7) but not of others which contain quoted materials. When the gradient raising occurs, the same relative contours, conditioned by stresses, vowel clusters and pause, are maintained, but all are gradiently higher.

Rhythm units may likewise be slowed or extended gradiently from normal speech to that of sleepy or tired situations. The non-structured variation lacks the intensity and precision of attentative rhythm types.

[12] Gradient differences of pitch in English or Comanche as opposed to the structured contrastive levels of English, are more directly associated with the physiological conditioning of which Bolinger speaks (see fn. 5). Physiological tension may vary the range between English phonemic pitch levels, as it may vary the range between the levels of languages with phonemic lexical tone, but so long as there is a point in any speech context beyond which the meaning changes, the levels are arbitrarily contrastive and not physiologically conditioned. Pike points out to me that the contrast between John, John, John, (with tone 4-3, 4-2, 4-1 respectively), may be maintained in normal voice, falsetto, or laryngealised speech ('low voice') and that the range may be small or great, but WITHIN ANY SPEECH STYLE THE CONTRAST IS PRESENT AND ARBITRARY, not 'instinctive' or 'physiologically' determined. The contrast is a conventionally structured one even though high pitch may be associated with emotional tension.

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from the above list, is another feature: tĭtfi is said by little girls for tĭ·i, *girl friend;* pipiá for piá *mother*, etc. Although reduplication is present in Comanche as a grammatical process, it performs no ostensible grammatical function in the child's speech. Various phonemic substitutions are made; p for kw as pfhI for kwĭhĬ *wife;* pánA for kwánA *odor, smell;* also i for ĭ as tiás for tĭas, etc. One person carries the personal name, pitá·si? *one who always defecates*, a "baby name", where a p is substituted for the kw in kwĭtA *defecate!*, and the suffix -sI is also added. These substitutions are not regular, but are commonly made by children learning to speak. Somewhat more regular is the substitution of t for r (see examples in the word list).

Several facts become apparent upon study of the above list of baby words. First, it must be recognized that these function not as single, simple words, but as whole sentences with many different, albeit related, possible meanings (exclamatory, imperative, declarative, interrogative) which are elucidated by gestures, intonations, and the context of the situation. They are really sentence-words. Phonetically the baby words are simple: there are no preaspirated consonants; the sonant plus h does not appear; whispered vowels and the defective phonemes, r and v, are rare and their appearance is probably late in the speech development of the child. The x phoneme and the long m are unique to the baby vocabulary.

Reduplication is evident and appears to be especially common in those words generic to the baby language and basic to it. The baby word phonetic pattern of two syllables with the second vowel accented, long, and usually ending in a glottal stop occurs in most of the examples. Words derived from the adult vocabulary are put into this pattern, as may be seen from the relationship terms. Presumably it is in this phonetic form that words are first presented to the child. This seems consistent with our practice of carefully enunciating words when teaching them to a child.

25: Canonge L-5 (1948 1957 NO6 Coma he NO6
Okla oma

VOICELESS VOWELS IN COMANCHE

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0. Introduction
1. Contrast in identical environment
2. Contrast in analogous environment
3. Pre- and/or post-syllabic vocoids
4. Rigg's interpretation B

0. To date, several published articles on Comanche[1] have postulated phonemic voiceless vowels in syllabic position. In spite of these reports, however, the phonemic interpretation of such vocoids as voiceless vowels is still considered an improbability by some scholars. In order to allay the general doubt expressed by Jakobson, for example, in the first printing of his 'Preliminaries', as to the existence of phonemic voiceless vowels in any language, I supplied him with tapes containing such sounds. In his second printing, he added spectrograms[2] illustrative of the difference between Comanche /i/ and /I/ occurring on these tapes but in spite of the contrast therein, which can readily be seen by inspection, he retained his scepticism as to their phonemic inter-

[1] Joseph B. Casagrande, Comanche Linguistic Acculturation: I, IJAL 20.140 (1954); Henry Osborn and William A. Smalley, Formulae for Comanche Stem and Word Formation, IJAL 15.93 (1949); Venda Riggs, Alternate Phonemic Analyses of Comanche, IJAL 15.229 (1949); William A. Smalley, Phonemic Rhythm in Comanche, IJAL 19.297 (1953).

My own analytical research on this particular feature in Comanche has continued intermittently since 1948, when the data were presented to a seminar of the Summer Institute of Linguistics. Numerous informants have been used, chief of whom is Mrs. Emily Riddles, Walters, Oklahoma, whose patience has been greatly appreciated. I am also indebted to Kenneth L. Pike for numerous leads and practical suggestions in the preparation of this paper.

[2] Roman Jakobson, Preliminaries to Speech Analysis, Acoustics Laboratory, MIT, Report no. 13, (1952), Second Printing, 52, Fig. 12.

194 121 pretation: "Vowels are normally voiced. It is still questionable whether there are languages in which parallel to the consonantal opposition voiced vs. voiceless, there actually is a similar distinctive opposition of voiced and murmured vowels, as reported about a few American Indian languages, e.g. Comanche. Either the vocal murmur is not a distinctive feature and functions merely as a border mark, or it may be a concomitant of the tense-lax opposition."[1]

This article, therefore, is an attempt to supply more extensive data and argumentation on this point than previous authors have given, since to me it appears conclusive that, in Comanche, voiceless (or 'whispered') vowels in syllabic position are phonemic. The interpretation of phonetic voiceless vocoids in pre- and/or post-syllabic position will also be discussed.

194 1. The phonemic contrast of voiced and voiceless vocoids in syllabic position can be seen in their occurrence in identical environment. Here, surely, no conditioning factor is present. Note, for /e/ versus /E/, ʔu'kuʔ-ok^{w}ek^{w}aiʔu ʔ *she went to render it,* (e.g. *lard*), ʔu'kuʔok^{w}Ek^{w}aiʔu ʔ *she rendered it and went on.* In these two examples, the stress, length, pitch, rhythm, and phonological junctures are the same. The grammatical structure is also comparable: each begins with the morpheme ʔu- *object, 3d per. sing.*, followed by the morpheme ku- *heat as an instrument*; following the stem in each is the morpheme -k^{w}a *movement away*, the morpheme -i *past tense*, and the morpheme -ʔuʔ *subject, 3d per. sing.* The stem ʔok^{w}e means *a flowing or liquification with purpose directed toward the motion indicated*

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[1] idem. 26.

[p. 63-B]

194 196 193 *in the following morpheme*, whereas the stem ʔokʷE is a complex stem composed of ʔokʷe modified by the addition of the morpheme comprised phonetically of stem final unvoicing, and which has the semantic implication of *stem meaning resulting in action indicated by the following morpheme.*

194 Brought about by the occurrence of this same stem-final-unvoicing morpheme, and preceding -ki *movement toward*, similar contrasts between voiced and voiceless vowels can be observed, e.g. 'norɨnakiki?u? *he came to pack* versus 'norɨnakIki?u? *he packed and came on.* Again, no phonological or morphological conditioning factors are present. Similar contrasts can be seen in 'mayakeki?u? *he came to play* (e.g. *the piano*), 'mayakEki?u? *he played and came on*; ?u'hanikiki?u? *he came to fix it for him* versus ?u'hanikIki?u? *he fixed it for him and came on*; ?u'ni?aciki?u? *he came to advise him* compared with ?u'ni?acIki?u? *he advised him and came on.* Another contrast preceding -kʷa can be observed in 'namaka?-mukikʷai?u? *he went to dress himself* versus 'namaka'mukIkʷai?u? *he dressed himself and went on.* -ki and -kʷa are interchangeable in any of the illustrations listed above.

2. Utilization of analogous data should prove profitable, contrasting /u/ /U/, /o/ /O/, /e/ /E/. Thus ?u'?uhtuki?u? *he came to give to her* contrasts with ?u'?-utUki?u? *he gave to her and came on*; 'nohkoki-?u? *she came to bake biscuits* with 'nokOki?u? *she baked biscuits and came on*; and ?u'-manahkeki?u? *he came to measure it* with ?u'manakEki?u? *he measured it and came on.* These same stems occur with similar resultant contrasts preceding -kʷa.

Nothing in these word pairs is of such a nature or in such a position as to make a non-phonemic conditioning variation from voiced to voiceless a characteristic of the vowel. The theoretical possibility of /U/ /O/ being conditioned by voiced equivalents occurring in contiguous syllables preceding these voiceless vowels is partially eliminated

194 by the occurrence of /E/ in a similar construction in which the preceding voiced vowel is not identical with it, that is, /a/. Instances of vowel assimilation have been observed, e.g. -ru?I *future tense* occurs as -ro?I in 'nohkoro?I?u? *she is going to bake biscuits*. Here, however, a change of vocalic timbre is involved rather than a change of voiced to voiceless. A more pertinent analogy may be noted in 'sikIti?u? *it is here*, 'sokOri?-u? *it is over there*, 'sukUri?u? *it is out of sight* and might seem to imply some sort of vowel agreement. However, e, indicating *scattered items*, occurring in a similar construction, results in 'sekIti?urii *they are here and there*, not *'sekEti?urii.

Furthermore, limited instances of the occurrence of /U/ and /O/ in environments in which neighboring voiced vowels are not of the same vocoidal timbre with them have been observed, e.g. ?u'hotUkonii *its hindquarters* and 'tuukOneni?'ʁuni? *I saw a black cradle*, in which the voiceless phoneme /U/ is preceded and followed noncontiguously by voiced /o/, and in which the voiceless phoneme /O/ is preceded and followed noncontiguously by voiced /u/ and /e/ respectively.

The influence of neighboring voiced vowels as a criterion for predicting the distribution of the particular vocalic timbre of the voiceless vowels can be ruled out since voiceless vowels occur in contrast in identical environment where no conditioning element is present, as in '?ica?ni'rüpI *this is my stone* compared with '?ica?ni'rüpE *this is my mouth*; and in nonconditioning analogous environment, e.g. '?ica?ni'kiikA *this is my onion*, '?ica?ni'hükI *this is my arbor*, '?ica?ni'?eekO *this is my tongue*.

In the analogy '?uhtu-, '?utU-; 'nohko-, 'nokO-; the presence or absence of /h/ (phonetically [U] or [O] in these instances) as a possible conditioning factor can be discounted since /h/ does occur (though rarely) contiguous to a syllable containing a voiceless vowel syllabic, as in ni'?uhtI *give it to me* compared with 'kimA *come!* or '?ica?ni'-

[p. 64-B]

194 wahcĬ *this is my rib* versus ʔica?nī'nakI *this is my ear.*

It may be noted here, furthermore, that there is frequently morpho-phonemic alternation between a pre-consonantal /h/ and a post-consonantal voiceless vowel preceding certain suffixes. Compare the stem alternants 'pohpi- and 'popI- before the suffix -tuʔI *future tense* and -ci *dependent completed action by the subject* in the illustrations 'pohpituʔInīʔ *I am going to jump* and 'popIcinīʔ'miaruʔI *having jumped, I will go.*

The contrast /ə/, /A/ is extremely rare due to the low frequency of occurrence of /A/ and its frequent morpho-phonemic alternation with /Ĭ/. Whereas the analogies 'pohpi-, 'popI-; 'coʔmE-, 'coʔmE-; 'ʔuhtu-, 'ʔutU- preceding -ki, -kᵊa and other morphemes are common, the analogy 'tihka-, *'tikA- would be erroneous. Rather, the second form would be 'tikĬ-. However, preceding -ci *dependent completed action by the subject* and ci, a syllable in the stem 'niʔaci- *to advise,* a valid contrast can be observed, e.g. 'miʔAcinīʔ'tihkaruʔI *having gone, I will eat* versus ʔu'niʔaciki?uʔ *he came to advise him.*

128 The preceding illustrations have given crucial contrastive data for each of the six vowel pairs. The following miscellaneous sets of forms supplement those given above and the phonemicization postulated in reference to them.

194 In the first set of examples, the contrast between /i/, /I/ occurs following stops and preceding the identical morpheme -nīī *plural,* e.g. 'papinīī *heads,* 'nakInīī *ears,* 194 'tiɴoowapInīī *teachers,* 'toʔInīī *pipes.* Note that it was a pair of this type which Jakob- 114 son used for his spectrographic analysis: 'tirīʔaiwapInīī *hired hands* and 'tīpinīī 114 *stones.* At the time the tape was sent to him, the minimal pairs quoted above had not been discovered and none occur in the data of Riggs and Smalley. Nevertheless, the earlier data of contrast in analogous (non-conditioning) environment appeared to all

[p.65-A]

114 of us conclusive even before the newer minimal pairs had been discovered and which have been included above.

194 In a specialized verb compound composed of noun plus verb, /i/, /I/ contrast preceding juncture in the set 'papiwĩnĬkatĩnĩ? *I have a headache* compared with 'nakIwĩnĬkatĩnĩ? *I have an earache.*

As the first syllable of a two syllable stem, the contrast /i/, /I/ may occur in stem syllables *not* contiguous to another morpheme following, as in the set 'tĩkᵛiɒukitĩ?u? *he is whipping (something)* compared with ?u'kĩkᵛIya?etĩ?u? *he habitually tastes it.* Here, the stem in the second instance is -kᵛIya- so that the unvoicing is not a product in this instance of a change at morpheme boundaries. Possible conditioning by the morpheme kĩ- *use of mouth or teeth* preceding, can be discounted by 'kĩ?okᵛetĩ?-u? *he is slobbering,* in which the vowel in the syllable following kĩ- is voiced, i.e. /o/.

Though the morphemes -kĩ *benefactive* and -ki *movement toward* differ morphologically, in the following set they present a phonologically nonconditioning environment in which to contrast /e/, /E/, e.g. ?u'-wihtokᵛekĩtĩ?u? *he is killing for her* versus ?urii'wihtokᵛEkĩtĩ?u? *he is killing them and coming on.*

The next sets of illustrations show contrast between /ĩ/ and /Ĭ/. They can be observed, for example, preceding -ka *stative* and -?e *habitual* in ?u'karĩkĩ?etĩ?u? *she habitually cooks it* compared with ?u'karĩkĬ-katĩ?u? *she is cooking it.* Note also the occurrence of voiced /ĩ/ preceding -ru?I *future tense* compared with the voiceless phoneme /Ĭ/ within a complex verb stem, as in the constructions 'pitĩru?I?u? *he will arrive* and 'patĬrĩyaai?u? *he drowned.* Preceding the dependent clause clitic -ku *dependent action being performed by secondary subject* and -ka, a like clitic denoting *completed dependent action,* a similar contrast is noted, e.g. ?uhka?u'karĩkĩkuma?'mi?a?I *as she was boiling that, he went* versus ?uhka?u'karĩkĬka-ma?'mi?a?I *when he boiled that, he went.*

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194 Contrast in a slightly different type of situation can be seen in the following instances in which /ï/, /Ĭ/ occur in syllables immediately preceded by morphemes, e.g. following nï- *person* and wï- *instrumental* in 'nïpikarï?u? *he is burying someone* and ?u'wïpĬkarï?u? *he is cutting it open.* However, stem syllables do not always unvoice following wï- as in ?u'wïnucai?u? *he broke it up* compared with ?u'wïnĬkï?ï?u? *he tightened it.* The phonetic similarity of the syllable ka immediately following the contrast in the first set presents a valid non-conditioning environment in which to compare the occurrence of /ï/, /Ĭ/. Furthermore, ka in each instance is a part of different unrelated stems (-pïka- *to bury*, -pĬka- *to cut open*) so that no morpheme boundary is involved.

Another type of analogical data is herewith mentioned, e.g. ?u'wïminaru?I?u? *he will break it* compared with ?u'wïmInaru?-I?u? *he will get sick over it.* The second example is written phonetically as [?u'wïMInaru?I?u?]. This constitutes a legitimate contrast since the allophones [m], [M] are conditioned by their relationship to vowels and not vice versa. That is to say, the total distribution of the phones [M], [N], [R], [W], [Y], [ᵖ], [kʷ], as opposed to their allophonic voiced equivalents, is preceding voiceless vowels. These voiceless consonant phones do not contrast with their voiced equivalents at any point, whereas voiceless vowel phonemes do contrast with their voiced vowel phoneme equivalents following /p/, /t/, /k/, etc. Other examples are ?u'hanïki?u? *he came to do it* compared with ?u'hanĬki?u? *he did it and came on*; ?u'-rïrïnitï?u? *he told him to do something* versus ?u'rïrĬni?ï?u? *he planted it*; and 'norïnaki?u? *she packed up* compared with 'norĬnaki?u? *she came to make a bed.*

3. Phonetic voiceless vocoids in non-syllabic position are phonemically interpreted as consonantal /h/ because of their

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194 noncontrastive phonetic characteristics. In postposed position, e.g. ['paAkipĬ], /'pahkipĬ/ *leather*, ['wiInu], /'wihnu/ *then*, ['noOkopĬ], /'nohkopĬ/ *biscuits*, ['paAMU], /'pahmU/ *tobacco*, ['seEka], /'sehka/ *those here and there*, ['tĭĬkapĬ], /'tihkapĬ/ *meat*, such vocoids always occur contiguous to, and have the same vocalic timbre as the voiced vowel syllabic. Such sequences as *aĬ, *iU, *oE, with diverse timbre between voiced and voiceless, are structurally impossible in Comanche. In [cvV] syllables, the voiced vowel is clearly heard as the peak of sonority. Thus, the distribution of /h/ in 'pohpi- *to jump* parallels the distribution of the consonant /ʔ/ in 'naʔnĭmĭnĭĭ *relatives*.

Similarly, pre-syllabic voiceless vocoids in utterance initial syllables, e.g. ['UuuUpI], /'huuhpI/ *tree*, ['AaʔniĬ], /'haʔniĬ/ *beaver*, ['ĬĭĭkI], /'hĭĭkI/ *brush arbor*, more closely parallel consonant distribution since all consonants except /ʁ/ and /r/ occur utterance initially, whereas voiced vowels do not. In addition, the vocoidal timbre of the pre-syllabic element here is completely conditioned by that of the following voiced vowel so that no vocoid sequence such as *Ĭa, *Ui, *Eo ever occurs.

Pre-syllabic voiceless vocoids also occur in the middle of words following /ʔ/, e.g., as in the sequence cvʔVv in ['naʔĬimuukU], /'naʔhĭmuukU/ *safety pin*. Interpretation of [V] as /h/ in this position reasonably follows since this position is otherwise normally occupied by consonants. For example, note 'cīʔcĭkiʔuʔ *he strangled*, ʔu'roʔnikaiʔuʔ *he put it away*. Here again, the voiceless vocoid in [cvʔVv] is completely conditioned by the following voiced vowel.

Phonetic voiceless vocoids occurring between voiced vowels have no distinguishing vocalic timbre, being phonetically colored at beginning and ending by the respective contiguous voiced vowels, as in 'nohituʔIniʔ *I am going to play*. Here, the phoneme /h/ is phonetically a vocoidal slur from a

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rounded voiceless vocoid to an unrounded voiceless vocoid but with the total slur appearing to take no more time than another voiceless continuant consonant such as /s/. Thus, the illustration given here could be written phonetically in some such way as ['noOIi-], but without the implication of an additional mora of length. In this position also, there are no contrasting vocoid sequences such as *aOa, *aIa, *aUa.

Other characteristics have been observed which differentiate between phonemic voiceless vowels and phonetic voiceless vocoids interpreted as /h/. Voiceless vowel phonemes occur in open syllables only, as seen in 'kupIta? *a light*, 'pukukI̥ni *a stable*, 'naʙUsa? *a chain*, whereas /h/ occurs contiguous to a voiced syllabic, opening or closing the syllable. In general, voiceless vowels maintain a full mora of length, though there often seem to be perceptible differences of length in reference to the different voiceless vowels occurring. Thus, /I̥/ of 'puhakI̥ni *a church* appears to be shorter than /I/ of 'kupIta? *a light*. The mora value of /h/, on the other hand, may vary considerably, not in accordance with its vocoidal timbre, but under various conditions of stress, deliberation, speed of speech, style, etc. Thus, /h/ in 'wihnu *then* ranges from a sharp vocoid [I] in slow deliberate utterance to mere breathiness of almost no-mora value in more rapid speech.

Voiceless vowels never occur in syllables preceded by pause or in stressed syllables. /h/ may occur in either, e.g. 'huuhpI *tree*.

4. Riggs[4] has stated a preference for her Analysis B in which consonant clusters resulting from post-syllabic h plus consonant are treated as unit phonemes, choosing to eliminate hc clusters at the price of nine new phonemes (or eleven phonemes, since hʙ and hy, not listed in her paper, also exist). To be consistent, one would also have to postulate a series of pre-glottalized con-

[4] Riggs, op. cit.

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194 sonants for ʔs, ʔm, ʔy, etc., which would
114 reduce the number of consonant clusters to
121 zero but would produce thirteen more new phonemes. All possible combinations of ʔ followed by a consonant occur except ʔʔ.

It is not economical to introduce twenty-three new phonemes into a system in order to eliminate two well-balanced types of consonant clusters, e.g. ʔc and hc. In both clusters, the first element is a glottal consonant, namely a stop and a fricative.

[195] Such an analysis, furthermore, disregards the perceptible division between syllables which occurs even in rapid speech, and, in exaggerated slowdown, informants show no tendency to treat hc as a close-knit unit but, rather, introduce a sharp break between the h and the consonant following. It is by no means impossible to assume that a single phoneme can be ambi-syllabic. Numerous such instances may be found but, as between alternate analyses, that one is to be preferred which interprets phonemes as mono-syllabic, other things being equal.

The interpretation of hc as a single phoneme results in needless grammatical complication. For example, the utterance translated *just nothing* may occur with alternate nonsignificant word order, e.g. 'nah'kehenA or 'kehena'nah. Under Rigg's Analysis B, in which hk constitutes a single phoneme, the allomorph of the morpheme meaning *just* is 'nah (three segmental phonemes) in the second citation but in the first instance, the alternate is 'na plus a feature (pre-aspiration) of the following phoneme. If, on the other hand, the alternant is assumed to be 'na (without pre-aspiration) in the first example, then 'kehena *nothing* of the second utterance has an alternant ʰ'kehenA in the first. The total distribution of 'na and ʰ'kehenA is the strict limitation of their occurrence contiguous to each other. Considering hc as a consonant cluster, however, would eliminate all such allomorphic problems and greatly simplify the analysis of the grammatical structure.

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221
224 **The Comanche were nomad buffalo**
hunters, constantly on the move, cultivating little from the ground, and living in skin tipis. They were long noted as the
181 finest horsemen of the plains and bore a
(186) reputation for dash and courage. They have a high sense of honor and hold themselves superior to the other tribes
142 with which they are associated. In person they are well built and rather corpu-
197 lent. Their language is the trade language of the region and is more or less understood by all the neighboring tribes.
● [194] It is sonorous and flowing, its chief characteristic being a rolling *r*. The language has several dialects.

614 The gentile system seems to be unknown among the Comanche. They have, or still
101 remember, 12 recognized divisions or bands
621 and may have had others in former times. Of these all but 5 are practically extinct. The Kwahari and Penateka are the most
[115] important. Following, in alphabetic order, is the complete list as given by their leading chiefs: Detsanayuka or Nokoni; Ditsakana, Widyu, Yapa, or Yamparika; Kewatsana; Kotsai; Kotsoteka; Kwahari or Kwahadi; Motsai; Pagatsu; Penateka or Penande; Pohoi (adopted Shoshoni); Tanima; Temawa or Tenahwit; Waaih.
101 In addition to these the following have also been mentioned by writers as divisions of the Comanche: Guagejohe, Muvinabore, Nauniem, Parkeenaum. See *Dotame*. (J. M.)

Allebome.—Lewis and Clark, Discov., 39, 1806 (so called by the French; see *Ne'-me-ein*, below). **Bald Heads.**—Long, Exped. Rocky Mts., I, 155, 1823. **Be'dälk'inago.**—Mooney in 14th Rep. B. A. E., 1043, 1896 (Kiowa name: 'reptile people', 'snake men'). **Cadouca.**—Domenech, Deserts N. Am., II, 100, 1860 (misprint of Padouca). **Camanche.**—Pike, Trav., xiv, 214, note, 1811. **Camanchees.**—Pilcher in Sen. Doc. 198, 25th Cong., 2d sess., 23, 1838. **Camarasches.**—Morse, Rep. to Sec. War, 367, 1822. **Ca'-tha.**—Hayden, Ethnog. and Philol. Mo. Val., 326, 1862 ('having many horses': Arapaho name). **Caumuches.**—La Harpe (1719) in Margry, Déc., VI, 289, 1886. **Caunouche.**—Beaurain, Ibid. **Caw-mainah.**—Gebow, Shoshonee Vocab., 8, 1868 (Shoshoni name). **Cemanlos.**—Escalante (1776) misquoted by Harry in Simpson, Explor. across Utah, 495, 1876. **Cintu-aluka.**—Corliss, Dacotah MS. vocab., B. A. E., 106, 1874 (Teton name). **Comances.**—Schoolcraft, Pers. Mem., 629, 1851. **Comancha.**—Barreiro, Ojeada, app., 2, 1832. **Comanchees.**—Abert in Emory, Recon., 470, 1848. **Comanchero.**—Gregg, Comm. Prairies, II, 56, 1844 (Spanish form). **Comanches.**—Sanchez (1757) in Doc. Hist. Mex., 4th s., I, 88, 1856. **Comanchos.**—Taylor in Cal. Farmer, Apr. 10, 1863. **Comandes.**—Maximilian, Trav., 510, 1843. **Comandus.**—Alegre, Hist. Comp. Jesus, I, 336, 1841. **Comanshima.**—Bourke, Moquis of Ariz., 118, 1884 (Hopi name). **Comanta.**—Gregg, Comm. Prairies, II, 34, 1844 (Comanche pronunciation). **Comauch.**—Morse, Rep. to Sec. War, 374, 1822 (misprint). **Cumanche.**—Doc. of 1720 quoted by Bandelier in Arch. Inst. Pap., V, 183, 1890. **Cumancias.**—Long, Exped. to Rocky Mts., I, 478, 1823. **Cumeches.**—Schermerhorn in Mass. Hist. Coll., II, 29, 1812. **Dä'tä'-as.**—Gatschet, MS., B. A. E. (Kiowa Apache name). **Gyaï'-ko.**—Mooney in 14th Rep. B. A. E., 1043, 1896 ('enemies': Kiowa name). **Idahi.**—Ibid. (Kiowa Apache name). **Inds.**—Hodge, field notes, B. A. E., 1895 (Jicarilla name).